EARLY INTERVENTION IN ACUTE ISCHAEMIC HEART DISEASE

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Abstract

Coronary angiography during the 1st few hours of evolving myocardial infarction has shown complete occlusion of the infarct related coronary artery in over 90% cases. This occlusion is due to a fresh formed thrombus. Thrombolytic therapy is commonly employed for lysis of the clot. We here report our experience with 20 patients undergoing either Intra coronary or Intra venous streptokinase thrombolysis. The average dose required for Intra coronary group was 1,20,000 units and that for' intravenous group was 750,000 units. No case of bleeding was noted. No mortality was noted in this group. The overall recanalization achieved was 66%. Intracoronary group was 72% and intravenous 60%. Our data shows that both intracoronary and intra venous streptokinase is safe and effective in early phase of acute ischaemic heart disease in Pakistani population (JPMA 38:34 , 1988).

INTRODUCTION

In the wide spectrum of coronary artery disease, the most fearful event for the patient and urgent need for therapy is the sudden onset of "Acute Ischaemic Episode". Acute Ischaemic Heart Disease (A.I.H.D.) may become sympto-matic and detected early, however, it may remain silent and discovered only with specialised tests. Acute ischaemia results from disturbed equili¬brium between myocardial oxygen demand and supply. Pathophysiologically it may be divided into two basic groups.

1) Increase in the demand of the "myocardial oxygen consumption" precipitated by physical exertion, emotion, or excitement, thereby causing imbalance in the supply demand equation of the myocardium, resulting in Acute ischaemic episode.

2) The second group comprises of patients in whom oxygen demand remains the same but sudden cessation of the blood supply heralds the onset of Acute Ischaemic Episode. Sudden stoppage of coronary blood flow is commonly secondary to thrombus formation, spasm or embolous. Dissection of the coronary artery and bleeding in the atheromatous plaques are also described. Treatment of the 1st group is well established but for the second group if early intervention is not undertaken then the Acute ischaemic episode may go on to develop myocardial infarction. There is now considerable evidence that infarct size' in man can be reduced by early treatment and in some cases threatened infarction can be aborted.'

MYOCARDIAL SALVAGE

The new concepts regarding the myocardial salvage may be expressed in simple words as "preservation of as much myocardiwn as possible", in other words, this is an attempt to halt the on¬going process of Acute ischaemic episode from advancing to the point of no return (Myocardial infarction). It is now established well beyond doubt that patients with acute myocardial in. farction undergoing coronary angiography in the 1st six hours will show a fresh thrombus in the infarct related artery in the majority of cases.[2,12] Intra coronary and I.V. streptokinase is widely used for thrombolysis in this situation in the Western countries. .[3-4,13-14] We report here the results of 20 patients undergoing I.V. and I.C.

thrombolysis at National Institute of Cardiovascular Diseases in the past one year.
AIMS OF STUDY: The aims of study were to:
1. Evaluate and define "safe and effective" thrombolytic dosage regimen for coronary thrombolysis in Pakistani population.
2. Evaluate the overall effectiveness in terms of angiographically proven coronary patency by comparing Intra Coronary and Intra Venous Streptokinase therapy.
3. Document the occurrence of minor or major bleeding/allergic complications.

MATERIAL AND METHODS

Twenty patients presenting in E.R. of National Institute of Cardiovascular Diseases with Acute ischaemic Episode (Table I & II)

TABLE I
Criteria for Inclusion.

*	Persistent chest pain resistant to S/L GTN
*	Duration less than 3 hours from onset of Acute Ischaemic Episode till the beginning of Catheterization

TABLE II
Criteria for Acute Ischaemic Episode.

*	Severe chest pain typical of myocardial ischaemia, present for at least 30 minutes, in addition, 2 mm ST segment elevation in 2 or more E.C.G. leads.

were selected for the study during the last 13 months. The age and sex distribution of these patients is given in the table number III.

TABLE III
Age and Sex Distribution.

Male	18	90%
Female	2	10%
Age distribution	22–65 Yrs.	
Age average	43.2 Yrs.	

TABLE IV
Criteria for Exclusion.

1–	Age more than 65 years.
2–	Patients who presented with cardiogenic shock (systolic B.P. less than 90 mm Hg).
3–	C.V.A.
4–	Menstruation in case of a female patient.
5–	G.I.T.(bleeding episode within last 2 years).
6–	Severe hypertension more than 200/100 mm Hg.
7–	Surgery or Trauma infarct 10 days.
8–	Hepatic dysfunction.
9–	Duration of infarction could not be estimated.

Table IV gives criteria for the exclusion from study.

PROCEDURE

INER

Patients in E.R. were given Isordil 5 mg S/L and Nitrodrum flS was immediately applied. Before being subjected to early intervention, all patients were thoroughly investigated for any contraindications, informed consent was obtained from the patients or relatives.

IN CATEL. LAB. (CORONARY REVASCULARI ZATION) (PTCR)

Depending upon the location of ST elevation in the 12 lead E.C.G. a right or left judkin 8 F catheter was advanced and selective visualization of the obstructed coronary artery was obtained by injection of urografin (76%). Thrombolytic therapy was instituted (see table V),

TABLE V

Strepto kinase.

1–	40,000 Units (Straptese, Hoechst Pharmaceutical Inc.) was infused in the infarct related vessel (each cc of streptase contain 4000 I.U.).
2–	4000 I.U. was given every 2 minutes till the total dose of 40,000 I.U.
3–	Repeat Injection of the contrast was medium performed to determine the lysis and reperfusion after giving 40,000, 60,000, 80,000 Units.
4–	The total maximum dose did not exceed more than 1,25,000 in our study.
5–	Attempt at mechanical thrombus perforation, with a soft tipped guide wire was done in one patient.
6–	After recanalization catheter remained below the diaphragm for next 24 hours.

subsequent therapy was given as indicated in table VI.

TABLE VI
Subsequent Therapy.

1–	All patients were given Inj. Heparin 5000 unit I.V. bolus and S/C B/D for a week.
2–	All the patients were put on tab. Tagamet 400 mg B.D. prophylactically during the anticoagulant therapy.
3–	Nifidipine (20 mg) T.D.S. was given to all patients.

PROTOCOL
Intmcoronary
PROCEDURE & PROTOCOL FOR I.V. STREP-
TO KINASE THERAPY
1. Same criteria (Table II,III,IV) were employed for intravenous group.
2. Each patient was given Inj. Hydrocortisone 100 mg bolus and tab. Tagamet 400 mg ED. started.
3. A total dose of 750000 I.U. of streptokinase (Streptase, Hoechst Pharmaceutical Inc.) dissolved in 50 cc dextrose water 5% was given over 30 minutes through a peripheral cannula.

DISCUSSION

All 20 patients reached hospital in 3 hours of the onset of symptoms. In the majority of cases this duration was less than 2 hours. The overall success rate of recanalization in our series was 66%. Those patients receiving intracoronary Streptokinase, the recanalization was achieved in 72%. The patency rate for I.V. streptokinase therapy was 60%. Intra coronary thrombolysis is much more effective than I.V. streptokinase. .[13] However the logistics of providing IC. therapy to all the patients with acute myocardial infarction is not feasible, due to obvious reasons. Michael Belunda.[5] et al has compared the efficacy of I.C. vs I.V. Streptokinase. Out of total of 25 patients selected for the study, 13 patients undergoing I.C. streptokinase therapy 11 were successful (84%), while in I.V. group only 8 out of 12 patients (66%) were successful. The patency rate of following I.V. streptokinase reported by Sol. al.[5] more than 90% patency rate was achieved. The dose used by these authors was 1.5 million units and was associated with significant major bleeding. The low rate of complication of our study is due to —
1) Use of 1.V. Tagamet
2) Dose of Streptokinase
In our population we have opted for minimal complication so the dose used is lower than the dose used by Western investigators, which has slightly compromised the rate of recanalization in our study, but reduced the significant incidence of minor or major bleeding. In the animal experimental models.[6,7] it has been shown clearly that reperfusion of the myocardium in the early period, reverses the Acute

ischaemic process and saves the myocardium from being permanently damaged. Non — surgical recanalization in Acute Ischaemic episode is now a well established procedure (i.C. or I.V.) Streptokinase and has been advocated.[8] if criteria for inclusion are met as described earlier. There is still discussion regarding the preferred method and number of the patient eligible. In a recent study by Jegger et al.[9] it has been shown that about 51% patients admitted to C.C.U. with the diagnosis of myocardial infarction were eligible for thrombolysis therapy. The most important factor in successful therapy is the time elapsed between the onset of the Acute Ischaemic Episode and start of thrombolytic therapy.[10]. In our patients at National Institute of Cardiovascular Diseases this interval is approximately equal to or less than that reported by Western investigators. This may well be due to the absence of usual delays caused by medical check up prior to referral to the hospital after the onset of chest pain. The effect of I.V. streptokinase therapy on mortality of acute myocardial infarction was estimated in 10 thndomized trials involving a total of 14355 patients, all 10 trial, 7 with I.C. and 3 with I.V. streptokinase, were randomized. There was a significant reduction in mortality in patients in the sub-group treated with I.V. streptokinase. .[4] A strong trend towards a greater reduction in mortality with earlier institution of therapy was found in GISSI Trial.[10,13] with 47%, 23% and 17% reduction in mortality rate in patients receiving therapy in less than one hour, less than three and three to six hours after the onset of symptoms respectively. Because coronary angiographic facilities are not available in most of the centres in Pakistan, and evenwhereit is available it is not possible to do it on emergency basis, so we recommend that I.V. streptokinase therapy, clinical guidelines may be employed to assess recanalization as employed by Kircher et al.[11].

RESULTS AND CONCLUSION

In our trial with I.C. and L.V. STK, the success rate for I.V. streptokinase was 60% and it is comparable with the success rate in early report.[15]. The success in I.C. group in 72% which is also comparable with similar studies.[16,17] The overall success rate is 66%, the reocclusion rate is not more than 5%. The criteria for reocclusion were a fresh episode of chest pain of more than half an hour duration with ST segment changes in the E.C.G. leads towing previous injury pattern. In our series of 20 patients, no mortality was noted. We also conclude that by employing the advocated dosage regimen, bleeding and allergic reaction are negligible in Pakistani population, and less than noted in certain studies, .[13,14,17] this may be due to concomittent therapy with Tagamet. We did not encounter any major haemorrhagic complication necessitating blood transfusion following I.V. or I.C. streptokinase therapy.

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